

Name: \_\_\_\_\_

Notes

Algebra Section 1.3

Pages 15-20



Date: \_\_\_\_\_



**Goals:** “I will translate verbal phrases into expressions”

“I will find a unit rate given two quantities”

**Vocabulary:**

**Rate:** A fraction that compares two quantities measured in different units.

**Unit Rate:** The amount for one. The denominator is zero. Use the word ‘per’.

**Writing Expressions**

\*REMEMBER THAT AN EXRESSION consists of numbers and variables and does not have an equals sign.

**Key Words**

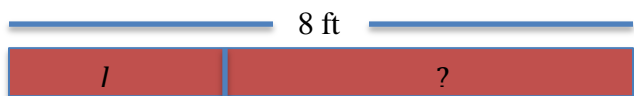
<b>Addition</b> <b>Sum   Added to</b>	<b>Subtraction</b> <b>Difference   Taken From   Less Than</b>
<b>Multiplication</b> <b>Product   Times</b>	<b>Division</b> <b>Quotient   Divided by</b>

Try These: Explain what is happening to 'Mr.  $x$ '.

- a) The **sum** of a number  $n$  and 5  $n+5$
- b) 4 **less than** the quantity 6 times a number  $n$   $6n-4$
- c) 3 **times** the **sum** of 7 and a number  $y$   $3(7 + y)$
- d) The difference of 22 and the number  $m$   $22 - m$
- e) The quotient when the 10 plus a number  $x$  is divided by 2  $\frac{10+x}{2}$

**Write an expression to represent each situation.**

- a) A piece of ribbon  $l$  feet long is cut from a ribbon 8 feet long. Write an expression for the length, in feet, of the remaining piece. (Draw a picture to help)



$$8 - l$$



b) You work with 5 other people at an ice cream stand. All the workers put their tips in a jar and share their tips equally at the end of the day. Write an expression to represent the total amount of money each worker will receive in tips at the end of the day. State what the variable stands for.

How much did they make in tips?  $x$

How many people are going to share the tips? 6

What operation should you use if they are going to split their tips? **Division**

Write the expression.  $\frac{x}{6}$

What does your variable stand for? The amount **of money in tips**.



c) You and 4 friends meet to have dinner at a restaurant. Everyone decides to order the nightly special. Write an expression to represent the total cost of the meal. State what the variable stands for.

How much does the nightly special cost?  $x$

How many people are ordering it? 5

Which operations should you use to find the total cost if everyone spent the same amount?

**Multiplication**

Write the expression.  $5x$

What does your variable stand for?

**Rates and Unit Rate****Example:**

12 tops cost \$10.80. Find the unit rate/price. (How much money per top?)

$$\frac{\text{Cost}}{\text{top}} = \frac{10.8}{12} = \frac{.9}{1} \quad \text{\$0.90 per top}$$

a) A car travels 110 miles in 2 hours. Find the unit rate.

$$\frac{\text{miles}}{\text{hours}} = \frac{110}{2} = \frac{?}{1} \quad \text{55 miles per hour}$$

b) You bought a gym membership and paid 3 months up front. The cost was \$120. Find the unit rate/price.

$$\frac{\text{Cost}}{\text{Months}} = \frac{120}{3} = \frac{40}{1} \quad \text{\$40 a month}$$

c) A 16-ounce box of cereal costs \$2.99. Find the unit rate/price.

$$\frac{\text{Cost}}{\text{Ounces}} = \frac{2.99}{16} = \frac{.19}{1} \quad \text{\$0.19 per ounce}$$

d) 9 gallons of gas costs \$29.70. Find the unit rate/price.

$$\frac{\text{Cost}}{\text{gallons}} = \frac{29.70}{9} = \frac{3.3}{1} \quad \$3.30 \text{ per gallon}$$

e) A jogger can run 4 miles in 38 minutes. Find the unit rate. (minutes per mile)

$$\frac{\text{minutes}}{\text{miles}} = \frac{38}{4} = \frac{9.5}{1} \quad 9.5 \text{ miles per minute}$$

Challenge:

### Multi-Step Problems

a) Your basic monthly charge for cell phone service is \$30.

You pay a fee for each extra minute you use.

One month you paid \$3.75 for 15 extra minutes.

Find your total bill if you use 22 extra minutes

Step 1: CALCULATE THE UNIT RATE (cost per additional minute)

$$\frac{\text{cost}}{\text{minutes}} = \frac{3.75}{15} = \frac{?}{1} \quad 3.75 \div 15 = 0.25 \quad \$0.25 \text{ per each additional minute}$$

Step 2: How much will it cost for 22 minutes?

$$0.25 \cdot 22 = 5.5$$

\$5.50 for 22 extra minutes.

Step 3: How much will the total bill be?

$$30 + 5.5 \\ 35.5$$

The final cost is \$35.50

b) You have a membership at a local ski club.

The membership costs you \$40 per month.

You must pay a fee for each lift ticket. It costs \$13.50 for 3 lift tickets.

You bought 7 lift tickets this month.

Step 1: Calculate the unit rate. How much does it cost for 1 lift ticket?

$$13.5 \div 3 = 4.5$$

\$4.50 per lift ticket

Step 2: How much will 7 lift tickets cost?

$$4.5 \cdot 7 = 31.5$$

\$31.50 for 7 lift tickets.

Step 3: What is the total cost this month?

$$40 + 31.5 = 71.5$$

The total cost for this month is \$71.50